IMPERIAL MYCOLOGICAL INSTITUTE
26 OCT. 1932

BERMUDA

# REPORT

OF THE

# DEPARTMENT

OF

# AGRICULTURE

FOR THE YEAR

## 1931

BERMUDA

# REPORT

OF THE

# DEPARTMENT

OF

# AGRICULTURE

FOR THE YEAR

1931

## CONTENTS


| | PAGE |
|---|---|
| Board and Department | 5 |
| Letter of Transmission | 6 |
| Report of Director | 7 |
| Agricultural Station | 7 |
| Bermuda Agriculture in 1931 | 8 |
| Government-Packed Vegetables | 10 |
| Selling Vegetables in Canada | 11 |
| New York Market | 13 |
| Major Crops | 13 |
| Minor Crops | 15 |
| Control of Plant Diseases and Pests | 16 |
| Inspection and Regulatory Services | 16 |
| Annual Agricultural Exhibition | 17 |
| Boys' and Girls' Agricultural Clubs | 20 |
| Staff | 21 |
| Financial | 22 |
| Report of Agricultural Assistant | 23 |
| Agricultural Station | 23 |
| Survey of Canadian Market | 26 |
| Report of Inspector of Produce | 30 |
| Report of Horticulturist | 32 |
| Care of Station Grounds | 32 |
| Trials and Plant Observations | 32 |
| Lily Experiments | 32 |
| Plant Pathology | 33 |
| Herbarium | 33 |
| Seed Exchange, Acknowledgments | 33 |
| Other Activities | 34 |
| Report of Government Veterinary Officer | 35 |
| Appendix A—Disposal of Produce | 36 |
| " B—Rainfall Recorded at Agricultural Station | 36 |
| " C—Report on the Bermuda Bulb Trade in Great Britain | 36 |
| " D—Expenditure (Exclusive of Salaries) | 38 |
| " E—Reimbursements to Government | 41 |
| " F—Farmers' Market | 41 |

# Board of Agriculture, 1931.

Honble. S. S. SURLING, C.M.G., O.B.E., M.C.P., St. Georges, Chairman.
Wor. B. C. C. OUTERBRIDGE, J.P., M.C.P., Smiths, Deputy-Chairman.
Mr. F. C. MISICK, M.C.P., Sandys.
Mr. W. A. H. BARNES, Southampton.
Mr. F. W. STEPHENS, Paget.
Mr. JOS. DE MOURA, Southampton.
Wor. T. H. H. OUTERBRIDGE, J.P., M.C.P., Hamilton.
Mr. JNO. SIMONS, Paget.
Mr. W. J. H. TROTT, M.C.P., Pembroke.

### TEMPORARY APPOINTMENTS.

Mr. E. W. OUTERBRIDGE, Hamilton,
Mr. E. J. MONIZ, Smiths, } from 7th August to 25th September.

# Department of Agriculture, 1931.

Director of Agriculture, E. A. MC CALLAN.
Plant Pathologist, H. S. CUNNINGHAM, Ph.D., M.S.A., B.S.A., to 15th May.
T. A. RUSSELL, B.Sc., A.R.C.S., A.I.C.T.A., Dip. Agr. (Cantab.) from 17th December.
Agricultural Assistant, W. R. EVANS.
Inspector of Produce, E. L. ADAMS.
Horticulturist, J. C. NAUEN.
Clerk, HILDA C. LINES.
Acting Clerk, ELIZABETH MILLER, from 28th June to 14th September.

### Part-Time Officers.

Government Veterinary Officer, C. J. COOPER, V.S.

Assistant Inspector of Produce, T. ARTHUR HOLLIS.
Sub-Inspectors of Produce, C. V. S. EARLY, J. W. M. GIBBONS and T. J. OUTERBRIDGE.

Agricultural Station,

Paget East, Bermuda,

21st September, 1932.

Sir,

I am directed by the Board of Agriculture to lay before His Excellency the Governor, for the information of the Legislature, the accompanying reports of the Department of Agriculture for the year ended 31st December, 1931.

I have the honour to be,

Sir,

Your obedient servant,

HILDA C. LINES,
Clerk, Board of Agriculture.

The Honourable,

The Colonial Secretary,

Hamilton.

# Report of The Director of Agriculture, 1931

The Chairman,
The Board of Agriculture.

I have the honour to submit herewith reports of the Department for the year 1931.

## AGRICULTURAL STATION

For information concerning potato and other vegetable experiments and live stock, see Report of Agricultural Assistant.

For information concerning horticulture, see Report of Horticulturist.

**Office Work.**—During the year 1,701 letters were received and 2,001 dispatched; an unusually large number of circular letters were sent out, and related chiefly to marketing. The usual statistical returns were made. The monthly Agricultural Bulletin was published, and completed its tenth year. A number of articles were written for the press, and Canadian market conditions were frequently published in the local newspapers. Certificates and copy certificates covering exports of lily bulbs numbered 4,690. Crop reports were prepared and issued. The shipment by the Department of Government-packed vegetables increased office work.

**Publications Received and Issued.**—Again grateful acknowledgment is made of the numerous valuable publications received, and once again it is necessary to express regret that it was found impracticable to fully index the Station library.

The Department's publications were restricted to 600 monthly copies of the Agricultural Bulletin, 500 copies of the Annual Report, 700 copies of the Exhibition Catalogue, 1,000 copies each of a leaflet, "What to plant next season for export to Canada", and a useful "Planting and shipping guide", the latter prepared by the Assistant, and as supplements to the November issue of the Bulletin lists of prizes offered for vegetables at the 1932 Exhibition.

**Visitors.**—Visitors to the Station included His Excellency the Governor and Lady Cubitt; Mr. L. F. Burrows, Secretary of the Eastern Canada Fruit and Vegetable Jobbers' Association; Mr. R. L. Wheeler, Transportation Expert of the Ottawa Department of Agriculture; Mr. F. E. Holloway and Mr. C. H. Gorham, representatives of the Colony's brokerage firms in Montreal and Halifax respectively; Mr. R. E. Montgomery, Adviser in Animal Health to the Secretary of State for the Colonies; Mr. G. A. Jones, Assistant Commissioner of Agriculture for the West Indies; Dr. E. G. Conklin of Princeton University, Dr. R. B. Thompson of Toronto University, Dr. K. H. Fernow of Cornell University, and others.

**Repairs and Additions to Buildings, etc.**—An addition, sixty feet long and three storeys high, was made to the Packing House, but was not completed within the year. The house is now 180 feet long and contains nearly 6,400 square feet of floor space which will be put to the following uses: For packing tomatoes, 2,000 square feet; for packing onions and potatoes, 1,200 square feet; for packing carrots and other vegetables, 1,200 square feet; for storage of crate material and empty crates, 1,600 square feet; and for storage of filled tomato crates, 400 square feet. A tank with approximate capacity of 5,300 gallons was excavated under the concrete floor of the addition to the Packing House. Additions were made to the grading machinery, which consists of a 24-bin motor-driven Cutler tomato grader, a No. 4 motor-driven Boggs onion and potato grader, two Pogue lidders and 250 feet of gravity conveyors.

The interior of the Station offices was painted and otherwise renovated. In this connection it is pointed out that the cleaning of the offices has for many years been paid for by this Department, and not by the Department of Public Works. Nearly all the exterior wood-work of the Exhibition buildings, tool barn, etc. was painted. The galvanized iron roofs of two sheds were painted with red oxide. Exhibition buildings, barns and other out-buildings were lime-washed. Four hundred feet of fencing was put up along the Berry Hill Road, and 400 feet at the south-east corner of the Station; 170 feet near Abbotsford was repaired. Gates were made for bull-yards and fences. Hurdles and wings were made for Exhibition use. Tools were repaired. A small electric saw and lathe was purchased.

The Department of Public Works remetalled the main drive, and furnished soil and rubble from the site of the Hospital tanks.

The following repairs and additions to buildings are needed: Extensive repairs to the glasshouses, and extensions to the office, exhibition and packing buildings, and quarters for Cattle-man and a large tank.

**Prison Labour.**—Prison labour amounted to 576 man-days, and was employed chiefly at excavating and concreting at the packing house, grading, lime-washing and Exhibition work. The cost to the Department was £13. 6. 0.

**Disposal of Produce.**—See Appendix A.

**Rainfall.**—Record of rainfall will be found in Appendix B.

## BERMUDA AGRICULTURE IN 1931

Weather conditions were unfavourable during the last three years, and in that respect 1931 was worse than either of its immediate predecessors. The year 1930 closed with heavy rains; in December 12.23 inches fell, and in January and February, 1931, 17.93 inches. March was a month of high winds which did much damage to tomatoes in particular. April was extremely dry with only .64 inches, and the celery crop in particular was injured thereby. May was normal with 5.15 inches, but June was dry with 2.52 inches. Fortunately June and July were unusually cool, and the exports of carrots and tomatoes continued throughout the latter month. Largely because of unfavourable weather, exports of vegetables were very small. Exports of lily bulbs were reduced chiefly because of the general trade depression.

Below are given the quantities of vegetables and bulbs exported, and the countries to which they were exported:

| Produce | U. K. | Canada | B. W. I. | U. S. A. | Other foreign Countries | Total |
|---|---|---|---|---|---|---|
| Beets, bushels | — | 620 | — | — | — | 620 |
| Cabbage, " | — | 5,109 | — | — | — | 5,109 |
| Carrots, " | — | 10,956 | — | — | — | 10,956 |
| Celery, " | — | 8,906 | — | 37,604 | — | 46,510 |
| Kale, " | — | — | — | 11,199 | — | 11,199 |
| Onions, " | — | 3,360 | 52 | — | — | 3,412 |
| Parsley, " | — | 76 | — | 302 | — | 378 |
| Potatoes, " | — | 1,763 | 27 | 36,645 | — | 38,435 |
| Tomatoes, " | — | 4,900 | — | — | — | 4,900 |
| Miscellns. " | — | 81 | — | 153 | — | 234 |
| Totals, bushels | — | 35,771 | 79 | 85,903 | — | 121,753 |
| Lily bulbs, cases | 364 | 196 | — | 3,659 | 51 | 4,270 |

The sales and nett farm values of exports follow:

| | Sales. | *Nett farm values |
|---|---|---|
| To Canada | £14,430 | £ 9,900 |
| To United Kingdom | 910 | 600 |
| To British West Indies | 32 | 20 |
| To United States of America | 44,411 | 25,000 |
| To other countries | 127 | 90 |
| Totals | £58,910 | £35,610 |

Agricultural exports were divided among our markets as follows. The percentages are on the basis of nett farm values.

| | 1930 | | 1931 | |
|---|---|---|---|---|
| United States of America | 83.8 | per cent | 70.2 | per cent |
| Dominion of Canada | 14.8 | " " | 28.1 | " " |
| United Kingdom | 1.1 | " " | 1.4 | " " |
| British West Indies | .06 | " " | .06 | " " |
| Other Countries | .2 | " " | .2 | " " |

The total vegetables exported during the last ten years were as follows:

| | | |
|---|---|---|
| 1922 | 379,082 | bushels |
| 1923 | 318,761 | " |
| 1924 | 416,604 | " |
| 1925 | 313,280 | " |
| 1926 | 426,896 | " |
| 1927 | 371,887 | " |
| 1928 | 420,802 | " |
| 1929 | 333,132 | " |
| 1930 | 244,589 | " |
| 1931 | 121,753 | " |

A comparison of the quantities of vegetables exported to Canada in 1930 and 1931 follows:

| | 1930 | 1931 |
|---|---|---|
| Beets, bushels | 388 | 620 |
| Cabbage, " | 2,061 | 5,109 |
| Carrots, " | 16,840 | 10,956 |
| Celery, " | 17,102 | 8,906 |
| Onions, " | 10,322 | 3,360 |
| Potatoes, " | 452 | 1,763 |
| Tomatoes, " | 6,581 | 4,900 |
| Miscellaneous " | 122 | 157 |
| Totals, bushels | 53,868 | 35,771 |

* Exclusive of all marketing charges, but not exclusive of cost of crates.

The nett farm prices obtained for vegetables sold in Canada were better (with exception of cabbage) than in the previous year, despite a lower general price level:

| | 1930 | 1931 |
|---|---|---|
| Beets, per 1-bushel crate | 3/9 | 4/2½ |
| Cabbage, per 3-bushel crate | 9/– | 6/6½ |
| Carrots, per 1-bushel crate | 3/8½ | 3/9½ |
| Celery, per 2-bushel crate | 8/3 | 8/8 |
| Onions, per 1-bushel crate | 3/6 | 6/11½ |
| Potatoes, per 1-bushel crate | 5/3½ | 6/1½ |
| Tomatoes, per 20-lb lug | 4/– | 4/4½ |

Since the inauguration of the "Lady" service by the Canadian National Steamships in 1929, the total quantities of vegetables shipped annually to Canada have been as follows. The quantities exported during the preceding three years are given for comparison:

| | | |
|---|---|---|
| 1926 | 27,488 | bushels |
| 1927 | 25,695 | " |
| 1928 | 21,633 | " |
| 1929 | 34,226 | " |
| 1930 | 53,868 | " |
| 1931 | 35,771 | " |

The low-temperature cargo accommodation on the "Lady" boats has made possible the export of perishable vegetables, and the growth of exports to Canada, exclusive of onions and potatoes, is shown below:

| | | |
|---|---|---|
| 1926 | 5,861 | bushels |
| 1927 | 6,874 | " |
| 1928 | 7,611 | " |
| 1929 | 30,283 | " |
| 1930 | 43,094 | " |
| 1931 | 30,648 | " |

It is estimated that the following quantities and values of locally-produced agricultural products were consumed in the Colony during the year under report:

| | | | |
|---|---|---|---|
| Bananas | 72,000 | bunches | £ 22,500 |
| Bulbs, planting stock | 1,400,000 | bulbs | 3,500 |
| Eggs | 140,000 | doz. | 21,000 |
| Milk | 456,000 | gals. | 76,000 |
| Pork and other meats | 414,000 | lbs. | 14,300 |
| Potatoes | 36,500 | bushels | 13,700 |
| Vegetables, miscellaneous | 83,000 | " | 25,500 |
| | | | £176,500 |

The estimated annual values of local products consumed locally and exported during the last eight years follow:

| | Consumed locally | Exported | Total |
|---|---|---|---|
| 1924 | £174,000 | £192,000 | £366,000 |
| 1925 | 166,000 | 104,000 | 270,000 |
| 1926 | 185,000 | 190,500 | 375,500 |
| 1927 | 191,000 | 133,000 | 324,000 |
| 1928 | 190,000 | 92,000 | 282,000 |
| 1929 | 191,200 | 106,400 | 297,600 |
| 1930 | 211,000 | 104,000 | 315,000 |
| 1931 | 176,500 | 35,600 | 212,100 |

## GOVERNMENT PACKED VEGETABLES.

The year witnessed a real beginning in Government packing of vegetables. Late in the previous season two shipments of tomatoes had been made, and the experience then gained was valuable in 1931, when additions to and improvements in building and machinery were made, a small staff of workers trained, and the work more or less systematised.

Reference is made under "Repairs and Extensions of Buildings, etc." to the additions made to the Government Packing House located at the Station. In May, at the request of the licensed shippers, an additional packing shed was opened at the farm of Mr. Jos. De Moura in Southampton, and all Government-packed vegetables were shipped by the Department in order that they might be more easily separated from farm-packed when discharged. At the two packing houses the following quantities of vegetables were packed:

| Vegetable | Number crates | Percentage of quantity exported to Canada |
|---|---|---|
| Beets | 81 | 13 |
| Cabbage | 173 | 10 |
| Carrots | 3,067 | 28 |
| Onions | 744 | 20 |
| Potatoes | 664 | 38 |
| Tomatoes | 9,207 | 79 |
| Miscellaneous | 32 | 20 |
| Total | 13,968 crates | Average 59 per cent |

Tomatoes were packed two tiers in 20-pound lugs. Each lug contained one of the following counts: 50's, 72's, 98's, 144's or gems. With the exception of the gems (jumble-packed), each tomato was wrapped. The lugs were lined, and the Colonial Mark appeared on the wrappers and on the attractive labels on the lugs.

The labour cost for packing all vegetables was £378, or 6.5 pence per crate. This cost included making some crates (some were delivered made up to the packing houses), pasting on labels, as well as grading, packing and other handling. The cost named, though high, should not be considered excessive having regard to the circumstances of the case, for the work was largely experimental, the workers were unskilled in the beginning, the buildings were too small, no machinery existed for grading vegetables other than onions, potatoes and tomatoes, and too often it was necessary to perform work in connection with the vegetables which should have been done by the growers. Night work added much to the cost.

Government-packed vegetables sold at higher prices than did farm-packed vegetables, as a rule. This should not be accepted as evidence that all Government-packed vegetables were superior to the best farm-packed, but that the former were more uniform in quality, size and weight, and were more attractively packed. Generally speaking, the poorest farm-packed vegetables set the price for all farm-packed.

Government-packed vegetables have established themselves in the Canadian market, and the proportion of future crops to be packed by Government should increase from year to year. This will demand a larger building and more machinery.

## SELLING VEGETABLES IN CANADA.

**Growing Importance of Trade.**—Notwithstanding the reduction in the vegetable exports to Canada during the year, due almost entirely to weather conditions as already noted, increasing interest in the Canadian vegetable market was apparent among farmers and shippers, also among the general public. Given good growing conditions, it was felt that exports to Canada would increase quickly.

**Growing Knowledge of Trade.**—Our knowledge of Canadian requirements and Canadians' knowledge of conditions here increased during the year.

The Director attended and addressed the annual convention of the Eastern Canada Fruit and Vegetable Jobbers' Association, held in Saint John, N.B., on 7th, 8th and 9th January. A small exhibit of Bermuda vegetables was shown. A report dated 3rd February was presented, and was printed, in part, in the February issue of the Agricultural Bulletin.

Representatives of the Canadian Department of Agriculture and of the brokerage firms selling Bermuda vegetables visited the Colony in February. The visitors addressed meetings, and met many interested in the sale of Bermuda vegetables in Canada. The names of the party will be found in "Visitors to the Station." Major R. L. Wheeler was engaged in a survey of transportation conditions.

Mr. W. R. Evans, Agricultural Assistant, was absent on duty in Canada from 4th to 27th April, and from 30th April to 29th June. His report, dated 12th August, contains much information regarding marketing conditions and requirements. See the Assistant's report on following pages, and September and October issues of the Agricultural Bulletin.

Crop reports were issued to jobbers and others in Canada. Information regarding Canadian market conditions and prices were published frequently in the Agricultural Bulletin, in local newspapers and in special leaflets. Experimental shipments of vegetables were made by the Department. Advertising by means of the distribution of potatoes, recommended by the Assistant and approved by the Board, was not done.

**Methods of Sale.**—The following occurs on page 23 of the Report for 1930:

> "At a joint meeting of the Board and shippers held on 19th December (1930) a majority of the shippers decided that sales should be through one representative broker in each of the key markets of Halifax, Saint John and Montreal. The shippers arrived at a majority decision regarding the selection of a brokerage firm in each of two markets, and tied in their selection of the third broker. In the latter case only was the decision of the meeting influenced by the votes of members of the Board who were not shippers. The form of sale decided on can be terminated by a majority vote."

The adoption of this method of sale was fully justified during the year under report.

**Shipping Committee**—It is to be regretted that the Board did not proceed further with its proposal that a shipping committee be appointed, to be composed of two licensed shippers (one a member of the Board) and the Director.

**Canadian National Steamships Schedule.**—Lessened exports were not sound arguments to put forward to secure increased sailings, but none the less, weekly sailings are essential to the full development of the sale of Bermuda vegetables in the Canadian market.

**Purchase of Crate Material.**—The purchase by the Department, and subsequent sale to farmers, of crate material required in the Government Packing Houses ensured an adequate supply of good material on hand throughout the season. Circumstances made it inexpedient to purchase the following season's (1932) requirements, and in that year the Department learned by painful experience that an adequate supply was not secured by private purchase.

Much attention was given to crate material. Many samples were examined. An improvement in crates was effected, but much more remained to be done.

**Cold Storage Facilities.**—Although the need for local refrigeration was generally recognised, no provision to supply the want was made in the year under report.

**Selection of Carrot and Tomato Strains.**—A large number of promising strains of carrot seed were planted at the Station for the purpose of making a selection therefrom. A start was also made with tomatoes. Attention was given to these two vegetables because they are the most important of our vegetable exports to Canada.

**Cable Code.**—A private cable code, prepared by Miss Hilda C. Lines, Clerk, was used by the brokers and Department, and a material saving in the cost of cables followed its use.

**Utilization of Rejected Tomatoes.**—At least twenty-five per cent of the tomatoes grown are unfit for shipment. Though the percentage of rejected fruit can be reduced by greater care in cultivation and handling, it will always be sufficiently large to make serious inroads in the growers' profits. The utilization of sound fruit, not suitable for shipment, in the making of tomato juice and canned tomatoes received consideration, but no action was taken.

**Acknowledgment.**—Before closing this section of my report, I desire to record the Department's appreciation of the many courtesies and valuable assistance received from many Canadians interested in the extension of trade between this Colony and the Dominion.

## NEW YORK MARKET.

New York continued to be our principal market, though exports to it were reduced from 83.8 in 1930 to 70.2 per cent in 1931. To New York was shipped (on nett farm price basis) 100 per cent of kale, 98.5 per cent of potatoes, 65 per cent of celery and .8 per cent of other vegetables.

Kale and early potatoes may continue to sell at fairly profitable prices in United States, but it is doubtful if other vegetables can be sold there profitably in the future.

## MAJOR CROPS.

**Carrots.**—Exports of carrots during the last ten years were as follows:

| | | |
|---|---|---|
| 1922 | 76,438 | bushels |
| 1923 | 60,894 | " |
| 1924 | 88,745 | " |
| 1925 | 62,620 | " |
| 1926 | 68,996 | " |
| 1927 | 44,833 | " |
| 1928 | 42,250 | " |
| 1929 | 7,994 | " |
| 1930 | 19,255 | " |
| 1931 | 10,956 | " |

Once exported to the United States in relatively large quantities, carrots are likely to become the largest vegetable export to Canada. Carrots should be seeded thinly in deep, well manured land. Little if any castor pomace should be applied, and no nitrate of soda.

**Tomatoes.**—Exports of tomatoes during the last nine years were as follows:

| | | |
|---|---|---|
| 1923 | 1,024 | bushels |
| 1924 | 1,048 | " |
| 1925 | 624 | " |
| 1926 | 3,081 | " |
| 1927 | 5,396 | " |
| 1928 | 1,584 | " |
| 1929 | 8,051 | " |
| 1930 | 6,581 | " |
| 1931 | 4,900 | " |

Tomatoes are likely to become one of the most important vegetables exported to Canada. The soil should be well manured and sheltered for the early crop which should be staked and pruned. Early spraying with Paris green or lead arsenate should be made to reduce damage by insects. The fruit should be handled carefully to lessen mechanical injury. "Eggs should be handled as carefully as tomatoes" is a good slogan for tomato growers.

**Celery.**—Exports of celery for the last ten years were:

| | | |
|---|---|---|
| 1922 | 56,806 | bushels |
| 1923 | 40,302 | " |
| 1924 | 67,191 | " |
| 1925 | 41,210 | " |
| 1926 | 74,572 | " |
| 1927 | 109,302 | " |
| 1928 | 129,266 | " |
| 1929 | 155,894 | " |
| 1930 | 113,080 | " |
| 1931 | 46,510 | " |

As prices in New York are no longer profitable and the demand in Canada at present is limited, exports of celery are not likely to reach former shipment for some years to come. Increased care should be given to the control of celery pests and diseases.

**Onions.**—Exports of onions for the last ten years were as follows:

| | | |
|---|---|---|
| 1922 | 70,874 | bushels |
| 1923 | 35,176 | " |
| 1924 | 41,848 | " |
| 1925 | 21,170 | " |
| 1926 | 39,336 | " |
| 1927 | 19,930 | " |
| 1928 | 16,063 | " |
| 1929 | 4,055 | " |
| 1930 | 10,737 | " |
| 1931 | 3,412 | " |

Exports of onions to Canada are likely to increase greatly provided that only bright well-cured bulbs are shipped.

**Potatoes.**—Exports of potatoes for the last ten years were:

| | | |
|---|---|---|
| 1922 | 111,403 | bushels |
| 1923 | 89,611 | " |
| 1924 | 94,011 | " |
| 1925 | 62,635 | " |
| 1926 | 91,933 | " |
| 1927 | 96,192 | " |
| 1928 | 110,136 | " |
| 1929 | 97,875 | " |
| 1930 | 65,953 | " |
| 1931 | 38,435 | " |

The rapid decline of potato exports is due to low prices in New York and small demand in Canada; it is possible, however, to increase the demand in Canada.

**Cabbage.**—Exports of cabbage during the last three years were as follows:

| | | |
|---|---|---|
| 1929 | 1,014 | bushels |
| 1930 | 2,061 | " |
| 1931 | 5,109 | " |

The demand in Canada for Bermuda cabbage is likely to increase if proper care is taken in its cultivation, grading and marketing. Charleston Wakefield is recommended. Rotation should be followed, and proper care given to the control of diseases and pests.

**Kale.**—Exports of kale (Couve Tronchuda) during the ten years were as follows:

| | | |
|---|---|---|
| 1922 | 37,191 | bushels |
| 1923 | 16,302 | " |
| 1924 | 28,053 | " |
| 1925 | 26,118 | " |
| 1926 | 28,599 | " |
| 1927 | 23,319 | " |
| 1928 | 13,827 | " |
| 1929 | 24,156 | " |
| 1930 | 14,220 | " |
| 1931 | 11,199 | " |

The cultivation of kale is confined almost entirely to farmers of Portuguese extraction and its sale to Massachusetts towns with fairly large populations of the same nationals. The marketing of kale has known many vicissitudes, and its demand is likely to lessen.

**Lily Bulbs.**—Exports of bulbs of the Bermuda Easter lily (*L. longiflorum*, var. *eximium*; trade name, *L. Harrisii*) during the last ten years were as follows:

| | | |
|---|---|---|
| 1922 | 1,604 | cases |
| 1923 | 3,116 | " |
| 1924 | 3,539 | " |
| 1925 | 4,040 | " |
| 1926 | 4,524 | " |
| 1927 | 6,043 | " |
| 1928 | 7,611 | " |
| 1929 | 5,864 | " |
| 1930 | 5,508 | " |
| 1931 | 4,270 | " |

The reduction in bulb exports has been due almost entirely to the world-wide trade depression. Bulbs are in the luxury class. Until general business conditions improve, increased exports are not likely, and growers are advised to reduce their plantings of bulbs, and substitute carrots, tomatoes and other vegetables suitable for sale in Canada.

The Department continues under obligation to the Empire Marketing Board and to Mr. F. H. Burn of the Bermuda Trade Development Board, London, for assistance in advertising bulbs in the United Kingdom. Messrs. Robert Tucker and Co., the Board's representatives in London, are indefatigable in their efforts to increase sales.

See their report in Appendix C.

## MINOR CROPS.

**Export Crops.**—Of the minor export crops, beets, New Zealand spinach and beans are in fair demand in Canada. The demand for cucumbers is limited, and for parsley and squash still more limited.

**Green Manure Crops.**—Little attention is given by farmers to the cultivation of green manure crops, though soy beans and cowpeas are particularly well suited to local conditions, and the former is an excellent fodder crop as well.

## CONTROL OF PLANT DISEASES AND PESTS.

See Plant Pathologist's report to 15th May. The post remained vacant until 17th December. During the vacancy the routine work was carried out as far as that was possible by the Assistant and Horticulturist.

The growing value of tomatoes as an export vegetable emphasises the need to give special attention to the control of diseases and pests attacking it.

The two motor pumps were rented at twenty shillings per day each, and were used as shown below:

| | | |
|---|---|---|
| St. Georges | 16 | days |
| Hamilton | 9½ | " |
| Smiths | 4½ | " |
| Devonshire | 10 | " |
| Pembroke | 7 | " |
| Paget | 10 | " |
| Warwick | 1½ | " |
| Southampton | 1½ | " |
| Sandys | 0 | " |
| Total | 60 | days |

In 1930 the machines were rented 64 days.

## INSPECTION AND REGULATORY SERVICES.

**Bye-Laws.**—On 10th November the Board made Bye-Laws (Regulations) under the provisions of the Boards Act, 1929. These deal with (1) control of plant diseases and pests, (2) inspection and shipment of nursery stock, (3) inspection and shipment of produce, (4) importation of seed potatoes, and (5) sale of vegetable seeds. Bye-Laws dealing with control of contagious animal diseases were made on 6th November, 1930.

The new Bye-Laws (1) make provision for the importation of Narcissus bulbs under the conditions recommended by Dr. H. S. Cunningham, formerly Plant Pathologist.

Copies of these Bye-Laws may be obtained free on application.

On 10th March the Board fixed the fees to be charged by the Government Veterinary Officer, and reimbursed to the Treasury, for certain services performed under Bye-Laws dealing with the control of contagious animal diseases.

Practising veterinarians may obtain free from the Department certain pharmaceutical supplies.

Five cows were slaughtered because affected with tuberculosis, and the owners compensated. The General Board of Health has extended its activities with respect to the control of this disease.

**Licensed Shippers of Produce.**—The following persons and firms held licenses from the Board to ship produce during the year:

Benevides and Rego, Hamilton.
Bermuda Green Vegetable Growers' Association, Hamilton.
J. M. Darrell, Smiths.
Hill Company, Hamilton.
O. R. Loblein, Hamilton.
Pearman, Watlington and Company, Hamilton.
Stella Benevides, Paget, or Manuel F. Simons, Paget (kale only).
W. A. Young, Pembroke (to New York only).

**Farmers' License.**

E. J. Moniz, Devonshire.
E. W. Outerbridge Company, Hamilton.

**Licensed Shippers of Bulbs.**—The following persons and firms held licenses from the Board to ship bulbs during the year:

T. O. Covel, Hamilton.
Henry and Lee, New York and Hamilton.
Malcolm Hollis, Harrington Sound.
T. A. Hollis, Crawl.
E. W. Outerbridge Company, Hamilton.
H. E. D. Smith, St. Davids.
Stephens Brothers, Paget.

**Registered Seed Vendors.**—The following persons and firms were registered to sell vegetable seeds during the year:

Bermuda Green Vegetable Growers' Association, Hamilton.
Hill Company, Hamilton.
O. R. Loblein, Hamilton.
E. W. Outerbridge Company, Hamilton.
J. H. P. Patterson, Somerset.
Peniston and Curtis, Hamilton.
T. J. Wadson and Son, Hamilton.

## ANNUAL AGRICULTURAL EXHIBITION.

The twelfth Annual Agricultural Exhibition was held at the Agricultural Station on 21st, 22nd and 23rd April, after postponement from 24th, 25th and 26th March.

The presence of His Excellency the Governor, Sir Thomas Astley Cubitt, K.C.B., C.M.G., D.S.O., and Lady Cubitt, who had arrived in the Colony the previous day, combined with ideal weather, caused an unusually large attendance on the first day, and the interest then aroused was continued during the second and third days, and the estimated attendance of 16,000 was a record one. (The attendance at the Exhibition has more than doubled in ten years.) The Exhibition is always characterised by a cheerful community spirit, and 1931 was the happiest as well as the largest yet held.

Entries numbered 6,848, which was 116 per cent of those of the previous year and 142 per cent of the average of the preceding five years. The number of entries during the past five years were:

| | |
|---|---|
| 1926 | 3,939 |
| 1927 | 4,208 |
| 1928 | 4,702 |
| 1929 | 5,303 |
| 1930 | 5,886 |

Brief comments on the exhibits follow: Horses were exceptionally good. Cattle were scarcely as good as in 1930, but better than the average of recent years. Poultry was decidedly poor, and in no other feature of the Exhibition was the absence of Mr. W. R. Evans more keenly felt. Because of unfavourable weather, vegetables were poor. Flowers, both in quantity and variety, were good.

Reference is made in "Agricultural Clubs" to school children's exhibits.

A comparison of the number of entries is given below. In the first column is the average at Rosebank in the years named, in the second

column the number in 1922 when the Exhibition was resumed after the War, and in the third column the entries in the year under report.

| | Rosebank | Agricultural Station | |
|---|---|---|---|
| | 1893 to 1903 | 1922 | 1931 |
| Horses | 22 | 86 | 208 |
| Cattle | 29 | 46 | 80 |
| Pigs | 10 | 2 | 8 |
| Goats | 0 | 25 | 38 |
| Rabbits | 0 | 13 | 84 |
| Poultry | 79* | 37 | 288 |
| Dogs | 49 | 43 | 136 |
| Cats | 21 | 0 | 0 |
| Vegetables | 207 | 88 | 543 |
| Fruit | 0 | 9 | 95 |
| Flowers and plants | 168† | 181 | 1,510 |
| Food products | 85 | 136 | 1,485 |
| Arts and crafts | 254 | 304 | 2,373 |
| Totals | 924 | 970 | 6,848 |

* Including Rabbits.
† Including Fruit.

## Financial Statement.

### Receipts.

| | 1930 | 1931 |
|---|---|---|
| Balance brought forward | £ – 18 6 | £ 15 8 1 |
| Granted by Appropriation Acts | 400 0 0 | 400 0 0 |
| Donated for special prizes | 8 2 6 | 22 0 0 |
| Gross receipts for advertisements in catalogue and programme | 144 7 0 | 146 9 0 |
| Ground rents | 107 6 0 | 95 0 9 |
| Entry fees | 5 6 11 | 8 11 7 |
| Gate receipts | 420 18 5 | 492 13 9 |
| Enclosure receipts | 109 19 9 | 136 19 4 |
| Bicycle receipts | 31 2 2 | 26 0 8 |
| Miscellaneous receipts | – 9 0 | – – – |
| Unpaid adult prize money | 2 2 6 | 2 15 0 |
| Totals | £1,230 12 9 | £1,345 18 2 |

### Expenditure.

| | 1930 | 1931 |
|---|---|---|
| Prizes to adults | £ 399 0 0 | £ 410 13 0 |
| Prizes to Clubs | 204 6 9 | 194 11 3 |
| Prizes for sports | 25 3 0 | 24 19 10 |
| Advertising | 11 3 4 | 39 16 3 |
| Printing and commission on advertisements in catalogue and programmes | 110 19 10 | 119 10 0 |
| Stationery and printing | 72 6 2 | 37 7 5 |
| Distribution of seed | – – – | 20 3 7 |
| Lumber | 39 2 7 | 15 13 0 |
| Carriages and teas | 60 14 1 | 15 12 0 |
| Cartage | 23 12 9 | 32 6 0 |
| Labour, field | 49 0 8 | 119 19 11 |
| Other material | 70 2 6 | 72 0 9 |
| Amusements | 24 6 0 | 6 6 0 |
| Watchmen | 6 0 0 | 6 0 0 |
| Gatekeepers | 26 5 0 | 34 10 0 |
| Checking bicycles | 10 0 0 | 10 0 0 |
| Carried forward | £1,132 2 8 | £1,159 9 6 |

**Expenditure**—(Continued.)

| | | | | | | |
|---|---|---|---|---|---|---|
| Brought forward | £1,132 | 2 | 8 | £1,159 | 9 | 6 |
| Checking cloaks | 1 | 10 | 0 | 1 | 5 | 0 |
| Clerical assistance | 46 | 4 | 6 | 47 | 15 | 0 |
| Depreciation, rental, etc. of W.D. stores | 29 | 0 | 0 | 29 | 18 | 0 |
| Paid for lost exhibits | 3 | 10 | 0 | 2 | 0 | 2 |
| Lighting and telephones | 2 | 17 | 6 | 3 | 0 | 0 |
| Balance carried forward | 15 | 8 | 1 | 102 | 10 | 6 |
| Totals | £1,230 | 12 | 9 | £1,345 | 18 | 2 |

Because of the unusually large attendance, for the first time a substantial balance was carried over.

Liberal special prizes encouraged competition.

Below are given the names of donors and winners:

**Asser Challenge Cup.**—Devonshire Parish won the Silver Challenge Cup presented in 1927 by His Excellency the Governor, General Sir J. J. Asser. The Cup was held by Mrs. E. C. Case.

**S. P. C. A. Prizes.**—Mr. Fred Smith, Pembroke, won the first prize of two pounds for truck horse.

Mr. H. Bean Wilson, Pembroke, won the second prize of one pound for truck horse.

Messrs. Terceira Brothers, Sandys, won the first prize of two pounds for hack horse.

Mr. E. R. Williams, Pembroke, won the second prize of one pound for hack horse.

**Bluck Prize.**—Mr. Arthur Woodgate, Pembroke, won the prize of three pounds donated by Hon. A. W. Bluck, O.B.E., M.C.P., for the best horse and turnout.

**Spurling Prize.**—Mr. E. R. Joell, St. Georges, won the prize of two pounds donated by Hon. S. S. Spurling, C.M.G., O.B.E., M.C.P., for the best donkey and trap.

**Bermuda Railway Company Challenge Cup.**—Mr. F. A. Hollis, Deepdale Dairy, Pembroke, won the Silver Challenge Cup presented by the Bermuda Railway Company, Ltd., for the best dairy animal in the show.

**Barnes Challenge Cup.**—Mr. W. E. Barnes, Paget, won the Silver Challenge Cup presented by Mrs. E. C. Barnes, Paget, for the best Jersey in the show.

**Roosevelt-Roosevelt Cash Prize.**—Five pounds presented by Mrs. J. Roosevelt-Roosevelt for a prize for vegetables was not awarded, and was carried over to 1932.

**Montgomery Sears Challenge Cup.**—Mr. Roy Mayor, Paget, won the Silver Challenge Cup presented by Mrs. Montgomery Sears for annual flowers.

**Purvis Prize.**—Mrs. W. A. Davis, Warwick, was the winner of one pound presented by Mr. W. S. Purvis on behalf of the Robin Hood Flour Mills for the best loaf of bread made with Robin Hood flour.

**Carter's Challenge Cup.**—Mrs. D. R. A. Bettington, Paget, won the Silver Challenge Cup presented by Messrs. James Carter and Co. for vegetables and flowers.

**Roosevelt-Roosevelt Cash Prize.**—Mr. J. T. Lynk, Paget, won the prize of two pounds presented by Mrs. J. Roosevelt-Roosevelt for Gerberas.

**Board's Gold Medals.**—Rev. W. B. Hughes, Devonshire, won a gold medal for string beans.

Mr. W. A. Young, Pembroke, won a gold medal for crated beets.

Mr. Henry Garcia, Smiths, won a gold medal for collection of vegetables.

Mr. F. G. Brangman, St. Georges, won a gold medal for onions.

Mr. H. R. T. Smith, St. Georges, won a gold medal for Triumph potatoes.

Fairy Isle Flower Shop won a gold medal for commercial exhibit of flowers and plants.

The following for poultry:

**Presented by Pearman, Watlington and Company**—Mr. Jack Hallett, Pembroke, Mrs. A. K. White, Southampton, and Mr. G. W. Fisher, Smiths, won prizes of Purina feed.

The following competitions were open only to members of the Poultry Association:

**Faulkner Shield.**—Mr. Jack Hallett, Pembroke, won the Faulkner Shield for the best bird in the show.

**Poultry Association Cup.**—Mr. W. G. White, Smiths, won the Society's Cup for the best exhibit of any one variety.

The Board did not accept the suggestion of the Bermuda Pool that the Exhibition should alternate with the Flower Pageant, but was prepared to consider the management of the two by the Department.

The Exhibition grows yearly in size, importance and popular favour. Its growth alone should silence those who cavil at it. It is an important aid to local agriculture, it is of great benefit to the youth of the Colony, it is of unique community value, and it stimulates local trade in the dull season following Easter.

## BOYS' AND GIRLS' AGRICULTURAL CLUBS.

Club work was again confined almost exclusively to the preparation of exhibits for the Annual Agricultural Exhibition. Vegetable seeds were issued to the Clubs. Very few Clubs were visited previous to the 1931 Exhibition, but before the year closed visiting in connection with the following year's Exhibition was begun.

The quality of the handicraft exhibits was not equal to that sent in the year before, though the number of exhibits shows an increase. The increase in the number of exhibits from year to year has been uniformily good save in 1926.

| | |
|---|---|
| 1922 | 300 |
| 1923 | 893 |
| 1924 | 1,555 |
| 1925 | 2,304 |
| 1926 | 1,662 |
| 1927 | 2,427 |
| 1928 | 2,633 |
| 1929 | 3,249 |
| 1930 | 3,547 |
| 1931 | 4,162 |

Following are comparisons of the number of entries received in each class in 1922 (first year after the Great War) an din 1930 and 1931:

| | 1922 | 1930 | 1931 |
|---|---|---|---|
| Horses | 4 | 4 | 8 |
| Cattle | 4 | 16 | 18 |
| Pigs | 0 | 1 | 1 |
| Carried forward | 8 | 21 | 27 |

| | | | |
|---|---|---|---|
| Brought forward..... | 8 | 21 | 27 |
| Goats ..... | 10 | 33 | 32 |
| Rabbits ..... | 10 | 72 | 60 |
| Poultry ..... | 10 | 68 | 115 |
| Dogs ..... | 6 | 63 | 39 |
| Vegetables ..... | 33 | 276 | 257 |
| Flowers and plants..... | 9 | 589 | 492 |
| Fruit ..... | 0 | 73 | 65 |
| Food products..... | 37 | 716 | 989 |
| Arts and crafts..... | 177 | 1,636 | 2,086 |
| Totals..... | 300 | 3,547 | 4,162 |

Following are the names of donors and winners of special prizes. The Department is under obligation to the donors.

**Trott Challenge Cup.**—Dudley Hill School Club won the Cup presented by Mr. W. J. H. Trott, M.C.P., for greatest advance over previous year's performance.

**Montgomery Sears Cup.**—Bermuda High School Club was the winner of the Cup presented by Mrs. Montgomery Sears for the greatest advance over previous year's performance with respect to points won for cut flowers. The Cup was held by Janice Mayor who won the highest number of points in the School.

**B. G. V. G. A. Challenge Cup.**—A. Pedro of Whitney Institute Club won the Bermuda Green Vegetable Growers' Association Cup for vegetables exhibited by a boy.

**Jackson Challenge Cup.**—Sheila Higgs of Bermuda High School Club won Hon. W. E. Jackson's Cup for vegetables exhibited by a girl.

## STAFF.

Mr. E. A. McCallan, Director of Agriculture, was absent from the Colony from 2nd to 16th January to attend the Sixth Annual Convention of the Eastern Canada Fruit and Vegetable Jobbers' Association in Saint John, N.B. See "Selling Vegetables in Canada". A report dated 3rd February was presented. The Director was re-appointed a member of the Immigrant Labour Board, and was appointed a member of the Board of Immigration which succeeded the first-named Board; his resignation was accepted by His Excellency as from 15th December. The Director was absent from duty because of sickness from 14th to 30th November.

The Board approved of the Director's attendance at the Agricultural Conference held in London on 14th—17th July, but pressure of work prevented.

Dr. H. S. Cunningham, Plant Pathologist, retired from the Department on 15th May on appointment to a post at the Research Farm of the New York State Experiment Station, Riverhead, Long Island, N. Y., U.S.A.

Mr. T. A. Russell, Plant Pathologist, arrived in the Colony on 30th December.

Mr. W. R. Evans, Agricultural Assistant, was absent on duty in Canada from 4th March to 27th April, and from 30th April to 29th June. A report dated 12th August was presented. Mr. Evans continued to be the Honorary Secretary-Treasurer of the Bermuda Poultry and Pet Stock Association.

Mr. J. C. Nauen, Horticulturist, was absent on vacation leave in England and the Continent from 20th July to 8th October. The post of Horticulturist was placed on the permanent staff during the year, and Mr. Nauen's contract was renewed.

Miss Hilda C. Lines, Clerk, was absent on vacation leave in England and the Continent from 28th June to 14th September. The post was temporarily filled by Miss Elizabeth Miller.

During the year under report there passed away George Edward Winter, long a member of the Department. Mr. Winter was a man of sterling character, who devoted a large part of his time to public interests.

## FINANCIAL.

The expenditure of £7,577. 14. 1. was authorised by the Appropriation Act of 1930, and Resolves 4 and 1 of 1931 and 1932 respectively. The sum of £7,418. 3. 3. was expended and a balance of £159. 10. 10. remained at the close of the year's accounts. These amounts are all exclusive of salaries. The sum of £280. 1. 1. was reimbursed to the Treasury. Details of expenditure and reimbursements will be found in Appendices D and E.

During the last ten years the expenditure of the Department (exclusive of salaries) and the receipts for the sale of vegetables, etc. were as follows:

| Year | Expenditure. | Receipts. |
|---|---|---|
| 1922 | £6,905 18 2 | £ 68 17 4 |
| 1923 | 4,163 6 10 | 75 0 11 |
| 1924 | 4,515 10 8 | 182 19 3 |
| 1925 | 4,851 16 7 | 129 18 9 |
| 1926 | 5,169 6 5 | 207 8 9 |
| 1927 | 4,560 15 5 | 346 2 4 |
| 1928 | 4,175 5 11 | 157 10 8 |
| 1929 | 4,348 6 10 | 193 0 1 |
| 1930 | 6,952 14 2 | 247 18 9 |
| 1931 | 7,418 3 3 | 280 1 1 |

Respectfully submitted,

E. A. McCALLAN,

Director of Agriculture.

Agricultural Station,

Bermuda.

8th September, 1932.

# Report of the Agricultural Assistant, 1931.

Director of Agriculture,

I have the honour to submit my report for 1931.

## AGRICULTURAL STATION.

**Vegetable Tests.**—These were chiefly tests of varieties and strains of vegetables with respect to their suitability or otherwise for export to Canada. Weather conditions were not favourable, and work was hampered by the claims of the Packing House, that is, the Station field workers were often of necessity transferred to the Packing House.

**Viability Tests.**—Under the provisions of Bye-Laws governing the sale of vegetable seeds, vendors are required to submit samples. The results of the samples tested for viability are summarised below:

| | |
|---|---|
| Germination very good or good | 67 per cent |
| Germination fair | 18 " " |
| Germination poor | 10 " " |
| Germination very poor or failed | 5 " " |

Under "Inspection and Regulatory Services" will be found the names of persons and firms registered as seed vendors. The fee is five shillings.

**Field Tests.**—Field tests were made with over 300 samples sent in by seed vendors or purchased by the Department in the United Kingdom, Canada, United States and France. No new varieties are recommended in substitution for those recommended in last year's report except the following:

Cabbage—Charleston Wakefield, in place of Jersey Wakefield.

Carrot —Dreer's Perfect Forcing is no longer recommended for the Canadian market.

**Tomato Field Tests.**—Weather conditions were unfavourable to tomatoes, and a very small crop was reaped from the first sowing made on 16th August and transplanted on 3rd October. The total yield was 6 crates or lugs per rod as compared with 9½ crates the previous year, but 34 per cent of the fruit was unfit for export to Canada. The tomatoes were sold locally at a profit of twenty shillings per rod.

The staking and pruning of early tomatoes is recommended. The following kinds of stakes were tested:

| Description | Size | Length | Cost |
|---|---|---|---|
| Pitch pine roofing laths | 1" x 2" | 4' | 4 pence |
| Cypress ceiling laths | ⅜" x 1" | 4' | ½ " |
| Bamboo, imported | ⅜" to ½" | 6' | ¾ " |
| Iron | ¼" | 5' | 3 " |

The lower ends of the wooden stakes were dipped in Solignum, a wood preservative, at a cost of ten shillings per 1,000 stakes. The iron rods are recommended as being the cheapest in the long run.

**Potato Tests.**—These tests were largely continuations of tests which have been conducted over a series of years to (a) observe the percentages of leaf-roll and mosaic present in seed imported commercially or by the Department experimentally, and (b) to study the results of treatments with chemicals to hasten germination. The later tests were under

the direction of Dr. F. E. Denny of the Boyce Thompson Institute of Plant Research, Inc., Yonkers, N. Y.

**Bermuda-grown seed.**—Bermuda seed grown locally one generation from Nova Scotia stocks was planted on 10th September, 1930, and dug on 12th December, 1930, but the results were not included in the Report for that year. They are given below:

| Variety. | N. S. Grower | Leaf-roll % | Mosaic % | Yield per rod |
|---|---|---|---|---|
| Early Ohio | Ex. Farm, Kentville | 1 | 0 | 35 lbs. |
| Green Mountain | Estabrook | 0 | 0 | 60 " |
| " " | Steel | 1 | 2 | 54 " |
| Irish Cobbler | " | 0 | 0 | 44 " |
| Triumph | " | 4 | 0 | 53 " |
| " | Jennings | 3 | 1 | 36 " |
| " | Stark | 3 | 0 | 41 " |

The low yields were due to dry weather. The yield from Early Ohio was particularly disappointing because it had been selected as a variety resistant to droughty weather.

**Imported Triumphs.**—Nebraska-grown seed for the 1931 crop was grown on Long Island, New York, under contract, and was inspected for the Department by Dr. S. E. A. McCallan of the Boyce Thompson Institute who reported absence of leaf-roll in all fields and traces of mosaic in but two fields in the sixteen inspected. "The potatoes were in excellent condition with respect to vigor and freedom from disease, and presented the best appearance in recent years." Nebraska seed, grown by L. Zookes, was donated by the Nebraska Cooperative Potato Association through the courtesy of Prof. H. O. Werner of the College of Agriculture, and Nova Scotia Triumphs grown by J. R. Jess were included in the test.

The seed was planted on 30th September and was treated with varying strengths of ethylene chlorhydrin (with check-rows not treated), and the results were highly satisfactory, as shown in the table below:

| Origin | Treatment | Vigor | Emergence on 3rd November | Yield |
|---|---|---|---|---|
| Nova Scotia | 4% | 93 | 71.5% | 24.6 |
| " " | 3% | 94 | 70.9 | 23.5 |
| " " | 1½% | 92 | 58.0 | 21.8 |
| " " | not treated | | 3.1 | 0 |
| Nebraska | 3% | 94 | 65.5 | 16.3 |
| " | 1.5% | 95 | 75.2 | 19.9 |
| " | not treated | 90 | 41.9 | 11.3 |
| Long Island | 1.5% | 95 | 88.1 | 21.0 |
| " " | not treated | 91 | 79.0 | 16.7 |

In the above table it is shown that the Nova Scotia seed which was the most dormant required the strongest solution for the best results, and that untreated seed sprouted but 3.1 per cent. The Nebraska seed, midway beween the Nova Scotia and Long Island, was most fully stimulated into sprouting by the weakest solution, and the Long Island seed, which in ordinary farm practice is planted untreated at this time responded to treatment to an appreciable degree. All the stocks treated with the optimum solutions gave increased yields, and the treatments were of practical value. The cost of the material is not more than one shilling per barrel, and the

method is very simple. The high yields from the Nova Scotia stock indicated that it might prove more profitable to plant than Nebraska stock. This will be further tested.

**New York Triumphs.**—A sample of Triumph seed grown in Batavia, N. Y., by Messrs. Hickox Rumsey Co. was received. The growth was most vigorous, and no virus disease was observed.

**Garnets.**—Garnet seed from Nova Scotia and Prince Edward Island was planted on 2nd to 4th February. The seed was field-inspected by District Inspectors of the Canadian Department of Agriculture, and showed satisfactory freedom from virus diseases.

| Origin | No. of plots | Leaf-roll | Yield per rod |
|---|---|---|---|
| Nova Scotia | 19 | 1.4 | 117 |
| Prince Edward Island | 9 | 0 | 107 |

**Green Mountains and Irish Cobblers.**—Prince Edward Island Green Mountains and Irish Cobblers were planted on 6th March. The first named gave a yield of 84 lbs. per rod, and the second 55 lbs. per rod.

Nova Scotia Cobblers were planted on 7th April, and gave an average yield of 78 lbs. per rod.

All samples were satisfactorily free from virus diseases.

**Tests for New York College of Agriculture.**—Samples of seed were planted for the New York College of Agriculture in order that early readings of virus and other diseases might be obtained. Dr. K. H. Fernow came to Bermuda for the purpose.

**Tests for District Inspector, Prince Edward Island.**—Samples of seed were planted for the District Inspector, Prince Edward Island, with the same object. The readings were made by the Department.

**Onion Tests.**—Comparative tests were made with Teneriffe seed and seed produced from bulbs selected in Bermuda and shipped to California. The selection from California gave definitely better results in the tests at the Station, and many growers reported favourably on the results obtained with California seed issued to them.

**Shallots.**—Experimental plantings of shallots were made in the first week in October and in the second week in November. Neither gave good results.

**Leguminous Green Manures.**—Soy or soya beans were planted, as usual, as a green manure crop on most of the experimental plots. On account of light rainfall in June the crop was very light.

**Fertiliser Tests.**—Comparative tests were conducted on potatoes and tomatoes with castor pomace or meal and a commercial complete fertiliser, Ammo-Phos-Ko, manufactured by the American Cyanamid Co., New York, U. S. A., and higher priced. No appreciable difference in yield was obtained by the use of the more expensive fertiliser.

**Sale of Seedlings.**—Considerable space was devoted to growing tomato and cabbage seedlings for sale to farmers. Farmers, as a rule, do not depend on the Station to produce seedlings for them, but our practice of growing seedlings for sale at nominal prices serves as some insurance against failure of seeds on farms.

The surplus seedlings from the experimental plantings were also sold at a nominal rate, largely to home gardeners.

**Live Stock.**—At the beginning of the year the Station live stock consisted of the following Guernsey cattle:

Montrose Hector (143,022); sire, Albamont Argonaut; dam, Dora of Atwood's Dairy; born 24th January, 1927; breeder, Department of Agriculture.

Colchester King (7,456); sire, Lindy's Slogan; dam, Daisy of Hillcrest; breeder, A. N. Faulkner, Great Village, N. S.

Albamont Juliet (85,736); sire Deanie's May King; dam, Juliana of Gerar; born 20th April, 1918; breeder, J. C. Haartz, Compton, N. H., U.S.A.

Canadian June (5,108); sire, Blanche's Raider of Nappan; dam, Canadian Spring; born, 8th June, 1926; breeder, A. N. Faulkner, Great Village, N. S.

Joy of Montrose (302,700); sire, Montrose Hector; dam, Juliana of Montrose; born 8th March, 1930; breeder, Department of Agriculture.

The following animals were born during the year:

Montrose Hermes (194,225); sire, Hector of Montrose; dam, Canadian June; born 19th January; breeder, Department of Agriculture. (On 22nd August, June gave premature birth to a dead heifer calf.)

Jean of Montrose; sire, Hector of Montrose; dam, Albamont Juliet; born 4th October; breeder, Department of Agriculture.

On 3rd March the Trinidad-bred Toggenberg doe Gertie gave birth to two male kids, Carib and Buccaneer, sired by La Suise Jupiter. Buccaneer was sold to Mr. Malcolm Hollis, and Carib was kept for breeding purposes. The imported Toggenberg buck La Suise Jupiter was destroyed, as it was no longer fit for service. The young Sanaan buck Prince imported from Trinidad in June, 1930, is not proving an active stud animal.

## SURVEY OF CANADIAN MARKET.

I was absent from the Colony on official duty in connection with the marketing of vegetables in Canada from 4th March to 27th April and from 30th April to 29th June. During these periods I visited the larger cities of Eastern Canada, and investigated the conditions under which imported vegetables were marketed and other matters connected with the extension of the sale in the Canadian market of Bermuda vegetables.

In my report on my investigations in Canada the various problems were discussed in detail, and the subjects dealt with in this report are synopses of the most important subjects then dealt with.

**The Present and Future of the Canadian Market.**—I found in most cities a strong sentiment in favour of mutual trade with Bermuda and the other Conference Colonies. With the adoption of modern methods of grading and packing and efficient distribution in the chief marketing centres of Canada, local farming may well be restored to its former importance in the Colony.

The experience of other countries has demonstrated that the production grading and packing and marketing of vegetables is a science.

We cannot profitably sell vegetables in Canada under the same conditions that we did in New York in the past, as New York, with its large population, approximately that of the whole of Canada, readily absorbed large quantities apart from its regular trade, so that large consignments of Bermuda vegetables were often disposed of at remunerative prices. Canada, however, with its total population not much in excess of that of New York City, distributed over a large area, must necessarily during the domestic off-season purchase its supplies in regulated quantities in advance.

and consignments of unknown quantities cannot, as a rule, be handled profitably either to the producer or the distributor.

Canada imports during our season of production quantities of vegetables in excess of our highest yearly production, with the exception of celery and onions. Considering this and the advantage we receive over foreign competitors by the favourable Canadian tariff preference, we should be able to establish a permanent and profitable market in Canada for our vegetables.

**Grading and Packing.**—Mechanical grading by the Department assisted to create a demand and establish a commercial value for the products packed and shipped under the Colonial Mark. This was particularly true of onions, potatoes and tomatoes, as the difference between farm and Government-packed in these commodities was very apparent. Government-packed commodities sold on an average of 10 to 12 per cent higher than similar farm-packed produce, and had the supply been equal to the demand the spread would have been greater still. While some of the farm-packed produce was graded and packed very well, it was impossible to obtain any premium for the good stuff as it was shipped on the same bill of lading and under the same shipping number, and it was impracticable to separate the good from the bad.

Government packing has made a definitely favourable impression in Canada.

**How Vegetables Should Be Prepared for Market.**—CABBAGE. From January to March the two-bushel crate is recommended. Only uniform heads of one variety should be packed together. The outer leaves should be left on. Cabbage should not be reaped any longer than fifty hours before shipment, unless it is held in cold storage.

CARROTS. Carrots should not be reaped any longer than fifty hours before shipment unless held in cold storage. Carrots should be washed immediately after reaping, as this reduces the natural heat in them and prolongs their sound keeping. Leaving a piece of the green top on loose carrots serves no useful purpose. The Maritimes require a medium large carrot, and any of the half-long varieties are acceptable. Uniformity, however, is essential, and only one variety of seed should be planted. The Upper Canada markets require bunched carrots, and a fairly long variety with a small top is preferred. The trade demands the number of bunches or the nett weight to be marked on the crates. Small topless carrots are not wanted in any Canadian market.

CELERY. The demand in Canada is for large celery, 5 or 4 dozens and larger. Small celery depreciates the value of larger sizes, and smaller than 5 dozens should not be shipped. Much of the grading is poor at present; if the count is approximately correct, there is generally a great variation in the sizes of the stalks. Every crate should contain the full number clearly marked thereon in half-dozens, of even sized stalks, well blanched and free from blight and other defects. Descriptive lists of the sizes should be attached to the bills of lading.

ONIONS AND POTATOES. The packing and grading of onions under the Colonial Mark is satisfactory. Some changes in the sizes of onions and potatoes may be desirable.

TOMATOES. The Government-packed tomatoes set a high standard this year, and further improvement in grading and packing will come with experience.

**Crate Material.**—The quality of many of the crates was poor, and the material was often very roughly sawn. It is poor economy to buy

crates on price basis alone. Often the loss to farmers because of wasty material is considerable, and the depreciation in the market value of the vegetables through breakage and poor appearance of the crates is not fully appreciated.

During my stay in Canada I visited two of the largest box plants in the Maritimes, and was impressed with the splendid facilities these plants have to produce containers of good quality.

**Canadian Customs Tariff.**—The general preference of thirty per cent on Bermuda vegetables imported into Canada should be considered a very satisfactory preference, but, in addition, on many occasions during the season Bermuda vegetables were further benefitted by seasonal duties placed by Canada on foreign vegetables to protect Canadian domestic vegetables. These seasonal tariffs were a great advantage to us.

Generally our vegetables do not sell in competition with Canadian domestic vegetables, and we should always be careful to discontinue our shipments so that they do not compete with Canadian vegetables.

**Cold Storage Necessary.**—Much of the spoilage which occurs in vegetables is due largely to heating between the time they are reaped and the time they reach the cold rooms in the ships. The sooner this heat is reduced the better the vegetables will keep. This obvious cure for this is pre-cooling and cold storage plant at the dock.

**Marketing through Brokers.**—The decision of the shippers to market exclusively through one broker in each of the three key markets of Eastern Canada was a great improvement on the old method of consigning shipments to a relatively large number of jobbers. The broker is an essential link in the orderly marketing of produce. He is the farmers' representative, who acts for them because they are unable personally to sell their own vegetables in Canada.

The three brokers appointed are well qualified, and I feel sure that their work in our interest was creditably done.

**Transportation Facilities by Canadian National Steamships.**—The refrigerated accommodation available on the C. N. S. steamers is inadequate to meet a reasonable development of our exports to Canada. True, we did not over-run the accommodation provided this season, and steamers left Hamilton empty or with little Bermuda cargo on occasions, but had weather conditions been favourable to crop production, conditions might have been different.

Increases in transportation facilities should precede crop increases, but I fear that this is not possible unless the Bermuda Government more heavily subsidizes the Canadian National Steamships.

I wish to record my appreciation of the keeness of the officers of the Canadian National Steamships to carry our produce in the best possible manner.

**Seed Improvement.**—During my stay in Canada I gathered considerable information regarding seed and seedling propagation which may be beneficial to us. I visited the Central Experimental Farm in Ottawa; Macdonald College, Quebec; and attended the Annual Convention of the Canadian Certified Seed Growers Association.

I made arrangements with Messrs. Dupuy & Ferguson, Montreal, to experiment with the production of seed from selected carrot stecklings produced in Bermuda during the winter and planted in Canada in the late Spring. It is hoped that the stecklings will produce seed before winter in Canada, and be available for planting in Bermuda during October or

November. If the scheme offers promise of success, it is proposed to carry out selection work on the same lines each year until a carrot most suitable to our needs is produced.

**Celery Seedlings.**—The production of celery seedlings in Canada during the summer for planting in Bermuda in the Fall appears to offer an opportunity to produce early celery, and thus lengthen the celery shipping season. I, therefore, arranged with Messrs. Dupuy & Ferguson to plant a small quantity of seed on their farm at St. Laurent, near Montreal. The seed was planted on 20th June, grew very well, and the seedlings were lifted on 5th October and arrived in Bermuda on 13th October. The plants were carried at 33 degrees F., and arrived in good condition. The bulk of the plants (about 5,000) were planted immediately after arrival under favourable weather conditions in pond-land belonging to Mr. F. E. Smith, Devonshire, and made a favourable start. Later, however, the ground became water-logged on account of excessive rains, and blight set in. Although the plants were dusted or sprayed with copper lime dust or Bordeaux regularly, adequate control was not obtained. Check lots planted by me in high land were also affected with blight, but its spread was largely controlled by frequent dustings of copper lime dust, and the plants grew to maturity quite satisfactorily.

**Disposal of Unmarketable Tomatoes.**—I enquired into the possibilities of converting into tomato juice over-ripe and sound tomatoes rejected from the packing-house. In view of the fact that tomato juice is canned in Canada in large quantities and is held over from season to season, it appears unlikely that it will ever be profitable to manufacture tomato juice for export.

Respectfully submitted,

W. R. EVANS,
Agricultural Assistant.

10th September, 1932.

# Report of the Inspector of Produce, 1931.

The Director of Agriculture,

I have the honour to present my report for the year 1931.

### Inspection of Seed Potatoes.

**Triumphs.**—Imported from Nebraska 200 bags (120 lbs. each) for March planting, and to be replanted for early Fall crop; from Long Isalnd, N. Y., 2,928 barrels for main Fall crop. The seed was in sound condition when inspected; tubers not too large, and clean and bright.

**Garnets.**—From Nova Scotia 2,612 barrels, and from Prince Edward Island, 348 barrels. The seed was sound, clean and bright, but did not yield a large crop compared with former years.

**Cobblers.**—Importations amounted to 306 barrels and 585 bags (120 lbs. each).

### Inspection of Produce.

The following comments are made on the various vegetables shipped.

**Beets** were poor, and a very small quantity was shipped.

**Carrots** were good, but the majority were small, and most were shipped without tops.

**Celery** was very poor throughout the season, and total losses occurred in some sections.

**Kale** was very good, with freedom from yellow leaves.

**Onions** were good, though small in quantity.

**Parsley** was poor during the first shipments, but improved very much as the season advanced.

**Potatoes.**—The first few shipments were Garnets, and these were small and of poor grade. Triumphs grown from Bermuda seed were also small, but later Triumphs from imported Long Island seed were much larger and better looking.

**Tomatoes.**—The tomato crop was good in quality, and showed better grading and packing when offered for shipment. I am still of opinion that all tomatoes should be graded and packed by Government.

**Quantities Shipped.**—See Report of the Director.

**Produce Rejected.**—Much of the produce rejected on first inspection was afterwards made fit for shipment and was passed on second inspection. Of the vegetables condemned on first inspection 51 per cent was celery and 28 per cent was potatoes.

**Supervision of Chill-rooms.**—Throughout the season the chill-rooms on the steamers were frequently inspected by Assistant Inspector T. Arthur Hollis, Sub-Inspector J. W. M. Gibbons and myself, and I have the satisfaction of reporting that the stowage was good at all times. Breakage of crates was very much less than in former years, due in large measure to better crate material.

**Acknowledgment.**—I wish to record my personal appreciation of the Wharfingers, the Dock Pursers and the Chief Engineers of the New

York and Canadian boats in connection with the loading and carrying of the crops during the season.

The information furnished me from Canada by the Agricultural Assistant, Mr. W. R. Evans, was very useful.

**Inspection of Crate Material.**

All crate material was inspected at time of importation, and was of better quality than in former years.

**Inspection of Lily Bulbs.**

Bulb inspection began on 9th July, and continued at six packing houses until the latter part of August. The bulbs were good, but the quantity shipped was below that of last year.

**Farmers' Market.**

A varied lot of produce was offered for sale, and although only four stalls were occupied, these were generally well filled with produce. The vendors appeared to be quite satisfied with their sales on the whole. On several occasions the vendors stated that more space would be appreciated.

**Summer Duties.**

Other summer duties were reported on monthly.

**Recommendations.**

Farmers should make smaller seedings at more frequent intervals, and should thin their root crops.

Better vegetables would result from the use of green manure crops and heavier dressings of barnyard manure.

More frequent farmers' meetings should give good results.

To control the importation of seed potatoes, which are duty free, the same should be imported by the Department.

All export bulbs should be packed at the Government Packing House.

Respectfully submitted,

E. L. ADAMS,

Inspector of Produce.

5th March, 1932.

# Report of the Horticulturist, 1931.

The Director of Agriculture,

I have the honour to submit my report for the year 1931.

**Care of Station Grounds.**—The Station grounds and plant houses were maintained in good order throughout the year. Minor changes and additions were made to several of the flower beds, shrubberies and lawns, and construction work was begun on a new three hundred by twelve foot shrubbery, situated immediately north of Mr. F. W. Stephens' property and parallel to the Packing House drive-way. It was not completed at the end of the year.

The slat-house proved invaluable, and together with the glass-houses was kept fully stocked with young plants.

A stock nursery for the more established plants and cuttings was made at the northern end of the Rosebank plot.

**Trials and Plant Observations.**—Trials with various ornamental exotic plants were continued, as in former years. Numerous seeds, bulbs, cuttings and plants were received from abroad and locally, and collecting trips were made to various parts of the Island to procure endemic and native plant material. The increase of plant stock by introduction and propagation was approximately 15 per cent over that of the previous year.

It was noted during the course of trials that:

1. The local alkaline soil conditions were quite favourable to many of the plants, more especially those of bulbous nature which matured before June, with few exceptions.

2. The incorporation of peat into the soil to neutralise alkalinity proved of value.

3. Mulching or surface-dressing with leaves or other suitable litter proved useful in conserving moisture in the soil during the summer months, and thereby not only prolonged the growing and flowering periods of the plants, but assisted them to survive the summer drought.

Outstanding amongst the bedding plants to prove themselves suitable were the various species and varieties of Arctotis, Dimorphotheca, Ursinia and Venidium. Other plants suitable for bedding purposes were the species and varieties of the more fleshy and woody stemmed herbs and dwarf shrubs, such as Abutilon, Barleria, Begonia, Beloperone, Cuphea, Crossandra, Echium, Galpimia, Hermania, Ixora, Leonotis and Pentas. A list of most of the newly introduced plants which have proved themselves suitable to local conditions was prepared, but is not published.

Observations were made of the various fruits growing throughout the Island. It was noted that invariably poor condition and disease were due to under-nourishment and the lack of protection from wind. Manuring or fertilising, heavy mulching, periodical spraying and the erection of suitable wind breaks were advised for the successful growing of fruits.

**Lily Experiments**—Experiments were begun with a view of improving the strain of the Bermuda Easter lily, *Lilium Longiflorum eximium* Nichols (*L. eximium* Court., *L. Floribundum* Hort., *L. Harrisii* Carr.) with a possibility of developing a distinct strain which would meet all the present-day market requirements.

No funds being available for this work, the experiments were begun in a very small way, with a hope that financial assistance would be forth-

coming and that the lily growers would give their wholehearted co-operation and assistance.

The modes of procedure were (1) by procuring local strains for selection purposes, and (2) by attempting to procure all known varieties and strains of the type species (*Lilium longiflorum*) for hybridising purposes.

**Plant Pathology.**—Together with the Agricultural Assistant, the general routine and inspection work of the Plant Pathologist was attended to during the latter seven months of the year.

Several confiscations of prohibited bulbs and plants were made at the General Post Office and docks.

Adults, as well as pupa and laeva stages of a palm weevil, were intercepted in the seeds of the Oil Palm, *Elaeis guineensis*, imported from the west coast of Africa.

Serious outbreaks of Palmetto scale, in the Tuckers Town district, and of Cedar scale on the Islands of the Great Sound were checked by lime sulphur spraying. No parasites were observed in either case.

Spraying materials were distributed for the control of insects and diseases, on request.

**Herbarium.**—Approximately one hundred flowering and fruiting specimens of various plants were collected dried and mounted, and together with some five hundred specimens of British Flora, collected in England during the years 1927-8, were added to the collection.

Part of the existing collection was renovated, and an endeavour was made to check over, cross-index and re-label all specimens according to the Kew Hand Lists and Bailey's Standard Cyclopedia of Horticulture, as these systems have been adopted for the labelling of all plants in the Station collection.

Specimens, numbering approximately fifty, sent in for indentification were determined.

**Seed Exchange, Acknowledgements.**—Owing to the numerous other activities throughout the year no seed exchange list was issued. The Department is, however, greatly indebted to the Directors and Superintendents of the undermentioned Stations for their continued contributions and co-operation.

**BRITISH.—Departments of Agriculture:**

Queensland, Australia; St. Lucia, B. W. I., Ottawa, Canada; Aburi, Gold Coast; St. Helena; Tanganyika Territory.

**Botanic Gardens:**

Vancouver, Canada; John Innes Institute, Merton Park, England; Kew, Surrey, England; Saharenpur, India; Dublin, Irish Free States; Victoria, Nigeria; Edinburgh, Scotland; Glasgow, Scotland; Singapore, Strait Settlements.

**FOREIGN.—Departments of Agriculture:**

Giza, Egypt; Honolulu, Hawaii; Washington, D.C., U.S.A.

**Botanic Gardens:**

Graz, Austria; Innesbruck, Austria; Brussels, Belgium; Gent, Belgium; Sofia, Bulgaria; Saigon, Cochinchina; Carolinae University, Prag, R. C. S.; German University, Prag, R. C. S.; Brno, R. C. S.; Copenhagen, Denmark; El Saff, Egypt; Marseille, France; Montpellier, France; Paris,

France; Berlin, Germany; Amsterdam, Holland; Groningen, Holland; Wageningen, Holland; Di Palermo, Italy; Parma, Italy; Pavia, Italy; Rome, Italy; Trieste, Italy; Ventimiglia, Italy; Zagreb, Jugoslavia; Kaunas, Lithuania; Algiers, North Africa; Oslo, Norway; Warsaw, Poland; Coimbra, Portugal; Bucharest, Roumania; Leningra, U. S. S. Russia; Odessa, U. S. S. Russia; Taschkent, U. S. S. Russia; Uppsala, Sweden; Basil, Switzerland; Zurich, Switzerland; Montevideo, Uruguay; Brooklyn, N.Y., U.S.A.; Lexington, Mass., U.S.A.; New York, N.Y., U.S.A.

In addition, the Department is indebted to the undermentioned subscribers.

**Abroad.**—Mr. W. Alick Lawrence, Canada and Venezuela; Mr. K. Yashiroda, Japan; Mr. E. O . Orpet, California, U. S. A.; Mrs. Lloyd, St. Helena; Rev. Father Cox, U.S.A.

**Local.**—Mr. C. A. Baker, Colonel William V. Ewers, Miss Mary Gray, Mrs. A. P. Hill, Mr. Alex. Smith, Mrs. A. B. Smith, Mr. R. R. Swainson, The Tucker's Town Development Company.

**Other Activities.**—All horticultural labour at the Station was supervised personally. Working and planting plans were prepared for all work undertaken. Attention was given to office work, and records of all experiments were kept up to date. Reports were submitted monthly.

The meetings of the various Garden Clubs and allied organisations were attended, and addresses, advice and assistance were given on planting and plans. Numerous gardens throughout the Island were visited.

Assistance was extended to Mr. T. C. Main in connection with the Pembroke Marsh Reclamation and Sports Ground planting and laying-out scheme. A planting plan of the Tennis Court layout was prepared and submitted to the Director of Public Works.

Respectfully submitted,

J. C. NAUEN,

Horticulturist.

30th May, 1932.

# Report of the Government Veterinary Officer, 1931.

Director of Agriculture,

I have the honour to submit my report for the year 1931.

During the year a few cases of distemper occurred among dogs, but no serious outbreak of contagious or infectious disease among any other class of animals, which, considering the number and variety imported into the Islands, is a matter for congratulation.

Following are the number and kinds of domestic live stock imported:

| | |
|---|---|
| Horses | 335 |
| Dairy cattle | 67 |
| Pigs | 355 |
| Dogs | 208 |
| Poultry | 1,083 |
| Other domestic animals | 162 |

Of the 745 cows tested for tuberculosis less than one per cent reacted to the test. I find the condition and breed of dairy cattle in the larger dairies fair, but in the smaller ones, and among the cows owned by families, there is not always good stock. I would like to see this improved. During my visits for tuberculin testing I took particular notice of bulls in the several localities, and found, with the exception of three, that they were all pure bred or good grade, and well cared for. With the valuable assistance of the Department, I was able to replace two of the three below standard, and I hope to replace shortly the remaining one in the same manner; thus improving the standard of bulls throughout the Island.

The exhibit of Guernsey cattle at the Agricultural Exhibition was particularly good, both in number and quality. Horses of the livery class also showed improvement, which I attribute, in some degree, to the good work of the local Society for the Prevention of Cruelty to Animals. Dogs at the Exhibition also showed improvement in breed and general condition, especially among the children's exhibits, and were more numerous than formerly.

The importations of poultry, particularly from the West Indies, frequently arrive in crates which are too low for comfort and are also overcrowded. This condition I am trying to overcome, with the assistance of the Steamship Companies.

Coolers and chillrooms throughout the Island were inspected regularly, and were found to be in good working order and sanitary condition. The meat offered for sale at the Farmers' Market was inspected weekly, and showed great improvement in quality and in the manner in which it is kept. The premises in which the animals are slaughtered are greatly improved in sanitary condition, due to the regulations of the Board of Health.

Respectfully submitted,

C. J. COOPER, V.S.,

Government Veterinary Officer.

20th January, 1932.

## APPENDIX A.

### DISPOSAL OF PRODUCE.

| | | | |
|---|---|---|---|
| Milk to King Edward VII Memorial Hospital | £ 92 | 5 | 0 |
| Vegetables to King Edward VII Memorial Hospital | 45 | 14 | 2 |
| Vegetables to other institutions | 41 | 12 | 0 |
| | £179 | 11 | 2 |

## APPENDIX B.

### RAINFALL RECORDED AT AGRICULTURAL STATION, 1931.

| | | |
|---|---|---|
| January | 8.15 | inches |
| February | 9.78 | " |
| March | 4.52 | " |
| April | .64 | " |
| May | 5.15 | " |
| June | 2.52 | " |
| July | 2.05 | " |
| August | 3.05 | " |
| September | 2.29 | " |
| October | 4.20 | " |
| November | 6.33 | " |
| December | 1.99 | " |
| Total | 50.67 | inches |

C. V. S. EARLY,
Station Foreman.

## APPENDIX C.

### REPORT OF THE BERMUDA BULB TRADE IN GREAT BRITAIN, 1931.

The present year has been the worst within the memory of the Horticultural Trade of this country; for some firms, little short of a ruinous disaster. As the facts of the recent financial crisis are known to everyone, all that need be said here is that the climax came at the season in which sections of the Trade expect to be at their busiest; the enforced curtailment of spending, affecting all classes alike, has created acute difficulties for those who found themselves with large stocks of perishable goods, and very little prospect of clearing except at a heavy loss.

The Trade Actions of Japanese lily bulbs provide an illustration of the extent of the slump. Formosum, Arabu, Multiflorum and similar kinds have been sold at 20/- to 30/- per case. Even the dark-stemmed Giganteums (the market growers' favourite) have only fetched 44/- at most, the average being about 35/-. Azorean Harrisii, fine looking bulbs, were knocked down at 12/- and 15/-, after repeated failure to draw any bid at all.

In contrast with other lilies, Bermuda Harrisii held their ground better than might have been expected. While it is regretted that the total sales have declined by 20 per cent, it is satisfactory to know that the average selling price was not more than 6½ per cent lower than in 1930. From this can be seen that the present system of advance selling, and the avoidance of any speculative consignments, have safeguarded the growers against the worst effects of the collapse.

Nearly all the regular buyers gave orders, but in most cases for smaller quantities than in previous years. If conditions had improved, that is no reason to doubt that many of the orders would have been increased in quantity; as matters turned out, it is likely that customers were not sorry that their stocks were smaller than usual.

As was to be expected, the bulk of the loss was in business with the wholesale seed houses. Amongst retailers, the sales were by no means unsatisfactory, the reductions in the quantities of some orders being balanced to a considerable extent by new business. Sales to market growers are now of little account, for reasons explained in the 1930 Report; and a few Continental orders had to be cancelled altogether owing to the financial difficulties.

Looking at the season as a whole, we do not think there is any reason for discouragement, or for supposing that Bermuda Harrisii are less popular. On the contrary, the fact that the result is not worse is evidence of their having established their position in certain sections of the Trade.

**Advertising.**—Lilies, grown from bulbs presented by the Board and by Mr. Malcolm Hollis, were displayed at Kew Gardens, Hyde Park and the Ideal Homes Exhibition. The Hyde Park bed was very well arranged; pictures and favourable comments appeared in the daily press and in the gardening papers.

Press advertising was on a reduced scale, but was appropriate in the circumstances. In a favourable season, a little more might be done with advantage in this direction, if practicable.

The leaflet was revised and reprinted; nearly 50,000 copies were circulated amongst the gardening public through the medium of high-class firms' catalogues.

As before, Mr. Burn kindly helped in these matters, which ensured that the best use was made of the money spent.

**Ministry of Agriculture.**—Early in the year we were asked to supply information about Bermuda Harrisii. Copies of the leaflet were supplied for the use of County Inspectors.

**Longiflorum giganteum.**—We were much interested to learn that the trial bulbs sent to Bermuda last year have yielded encouraging results. As was stated last year, very great importance is attached to this experiment. If the right bulb can be produced, it will open the way to business in a section of the trade for which Harrisii is generally considered to be unsuitable.

**Roman Hyacinth.**—Judging from information sent by Dr. Cunningham, there seems no doubt that this bulb can be grown in Bermuda. It is desirable that samples should be sent here for distribution to those who are likely to be interested in testing them.

ROBERT TUCKER & CO.

London, 20th November, 1931.

APPENDIX D.

## EXPENDITURE (EXCLUSIVE OF SALARIES) FOR THE YEAR ENDED 31ST DECEMBER, 1931.

### Personal Emoluments.

#### FEES TO MEMBERS OF BOARD.

| | | |
|---|---|---|
| Appropriated by Act No. 70 of 1930 | | £ 100 0 0 |
| Paid to members for attendance | £ 63 4 0 | |
| Unexpended balance | 36 16 0 | |
| | £ 100 0 0 | £ 100 0 0 |

#### RENT ALLOWANCE TO PLANT PATHOLOGIST.

| | | |
|---|---|---|
| Appropriated by Act No. 70 of 1930 | | £ 100 0 0 |
| Paid to Plant Pathologist | £ 51 13 11 | |
| Unexpended balance | 48 6 1 | |
| | £ 100 0 0 | £ 100 0 0 |

#### ASSISTANT INSPECTOR OF PRODUCE.

| | | |
|---|---|---|
| Appropriated by Act No. 70 of 1930 | | £ 175 0 0 |
| Paid in monthly wages | £ 166 2 7 | |
| Unexpended balance | 8 17 5 | |
| | £ 175 0 0 | £ 175 0 0 |

#### SUB-INSPECTORS OF PRODUCE.

| | | |
|---|---|---|
| Appropriated by Act No. 70 of 1930 | | £ 200 0 0 |
| Paid in daily wages | £ 152 4 0 | |
| Unexpended balance | 47 16 0 | |
| | £ 200 0 0 | £ 200 0 0 |

### Other Charges.

#### GENERAL GRANT.

| | | |
|---|---|---|
| Appropriated by Act No. 70 of 1930 | | £2,200 0 0 |
| " " Resolve No. 1 of 1932 | | 13 5 2 |
| Labour on experimental plots, lawns, flower beds, glasshouses and drives, and care of live stock | £1,555 11 3 | |
| Prison labour | 13 6 0 | |
| Carting and ploughing | 161 10 6 | |
| Seed potatoes, seeds and plants | 97 11 2 | |
| Manure and fertilisers | 19 5 0 | |
| Live stock—feed, bedding and incidentals | 211 13 9 | |
| Repair and renewal of buildings, tools, etc | 63 11 0 | |
| Stationery, printing and office supplies | 80 16 6 | |
| Foreign postage | 6 0 0 | |
| Cleaning offices | 4 0 0 | |
| | £2,213 5 2 | £2,213 5 2 |

## INSPECTION SERVICES, MARKETING INVESTIGATIONS AND CONTINGENCIES.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £1,000 | 0 | 0 |
| Inspection of vegetables at dock | £ | 149 | 10 | 7 | | | |
| Representative and exhibit at Jobbers' Convention, Saint John, N.B. | | 77 | 1 | 7 | | | |
| Representative in Canadian market | | 387 | 1 | 11 | | | |
| Canadian marketing experts' visits to Bermuda | | 133 | 14 | 9 | | | |
| Freight on experimental shipments to Canada | | 2 | 0 | 4 | | | |
| Advertising lily bulbs in England | | 139 | 16 | 1 | | | |
| Inspection of seed potatoes in Long Island, N. Y. | | 7 | 6 | 3 | | | |
| Celery plants grown in Canada for experimental purposes | | 10 | 1 | 3 | | | |
| Cables dispatched and received | | 74 | 19 | 8 | | | |
| Printing and stationery | | 18 | 7 | 7 | | | |
| | £ | 1,000 | 0 | 0 | £1,000 | 0 | 0 |

## ERADICATION OF ANIMAL DISEASES.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 75 | 0 | 0 |
| Compensation to owners of condemned stock | £ | 37 | 0 | 0 | | | | |
| Supplies and contingencies | | 30 | 12 | 6 | | | | |
| Unexpended | | 7 | 7 | 6 | | | | |
| | £ | 75 | 0 | 0 | £ | 75 | 0 | 0 |

## ERADICATION OF PLANT AND BULB DISEASES AND PESTS.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 200 | 0 | 0 |
| Labour | £ | 11 | 0 | 0 | | | | |
| Fungicides and insecticides | | 102 | 13 | 8 | | | | |
| Rental of plot of land for experiment with lilies | | 6 | 0 | 0 | | | | |
| Subscription to pathological periodicals | | 5 | 4 | 8 | | | | |
| Equipment and contingencies | | 75 | 1 | 1 | | | | |
| Unexpended | | – | – | 7 | | | | |
| | £ | 200 | 0 | 0 | £ | 200 | 0 | 0 |

## IMPROVEMENT OF LIVE STOCK.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 50 | 0 | 0 |
| Purchase of Saanen buck | £ | 4 | 11 | 10 | | | | |
| Purchase of poultry | | 16 | 18 | 3 | | | | |
| Registration fees | | 3 | 1 | 2 | | | | |
| Supplies and contingencies | | 23 | 10 | 3 | | | | |
| Unexpended | | 1 | 18 | 6 | | | | |
| | £ | 50 | 0 | 0 | £ | 50 | 0 | 0 |

## HORTICULTURE.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 150 | 0 | 0 |
| Labour | £ | 58 | 14 | 3 | | | | |
| Tools and implements | | 30 | 13 | 0 | | | | |
| Seeds, bulbs and plants | | 56 | 13 | 6 | | | | |
| Subscriptions to horticultural periodicals | | 1 | 18 | 8 | | | | |
| Postage on seeds, etc. dispatched to Botanical Stations | | 2 | 0 | 5 | | | | |
| Unexpended | | – | – | 2 | | | | |
| | £ | 150 | 0 | 0 | £ | 150 | 0 | 0 |

## DEPARTMENTAL CONTINGENCIES, TRAVELLING EXPENSES TELEPHONES, LIGHTING, ETC.

| | | | | | | |
|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 120 0 0 |
| Carriage hire | £ | 7 | 15 | 0 | | |
| Boat transportation | | 1 | 8 | 4 | | |
| Bicycle allowances | | 25 | 13 | 4 | | |
| Passage money of Plant Pathologist to New York | | 8 | 6 | 8 | | |
| Telephones | | 14 | 7 | 6 | | |
| Electric lighting and power | | 4 | 19 | 8 | | |
| Foreign postage | | 4 | 19 | 0 | | |
| Printing | | 30 | 0 | 0 | | |
| Supplies and contingencies | | 22 | 10 | 5 | | |
| Unexpended | | – | – | 1 | | |
| | £ | 120 | 0 | 0 | £ | 120 0 0 |

## PACKING HOUSE, SERVICES AND CONTINGENCIES.

| | | | | | | |
|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £2,000 | 0 0 |
| Labour, on building | £ | 149 | 1 | 2 | | |
| Labour, grading and packing | | 378 | 0 | 0 | | |
| Cartage | | 111 | 19 | 2 | | |
| Rental of packing shed, Southampton | | 6 | 10 | 0 | | |
| Lumber, iron sheeting and other building material | | 381 | 8 | 3 | | |
| Boggs onion and potato grader, parts for | | 41 | 16 | 9 | | |
| Onion blower | | 17 | 4 | 11 | | |
| Lidder and needle holders | | 27 | 10 | 3 | | |
| Rubber stamps and stencils | | 30 | 3 | 10 | | |
| Scales, weighing | | 9 | 0 | 0 | | |
| Saw, circular | | 4 | 7 | 10 | | |
| Crate material | | 41 | 4 | 2 | | |
| Labels and wrappers | | 653 | 9 | 0 | | |
| Paste and other supplies | | 50 | 9 | 3 | | |
| Lavatory, building of | | 18 | 7 | 7 | | |
| Installation of electricity, and light and power | | 33 | 16 | 3 | | |
| Cold storage on vegetables | | 16 | 5 | 8 | | |
| Printing | | 26 | 17 | 6 | | |
| Unexpended | | 2 | 8 | 5 | | |
| | £2,000 | | 0 | 0 | £2,000 | 0 0 |

## ANNUAL AGRICULTURAL EXHIBITION.

| | | | | | | |
|---|---|---|---|---|---|---|
| Appropriated by Act No. 70 of 1930 | | | | | £ | 400 0 0 |
| Labour, material and contingencies | £ | 400 | 0 | 0 | | |
| | £ | 400 | 0 | 0 | £ | 400 0 0 |

## PURCHASE OF TOMATO CRATES.

| | | | | | | |
|---|---|---|---|---|---|---|
| Appropriated by Resolve No. 4 of 1931 | | | | | £ | 500 0 0 |
| " " " " 1 " 1932 | | | | | | 94 8 11 |
| Paid for old-type crates | £ | 594 | 4 | 8 | | |
| Unexpended | | – | 4 | 3 | | |
| | £ | 594 | 8 | 11 | £ | 594 8 11 |

## PURCHASE OF CARROT SEED

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Appropriated by Resolve No. 29 of 1931 | | | | | £ | 200 | 0 | 0 |
| Cost of carrot seed | £ | 194 | 4 | 2 | | | | |
| Unexpended | | 5 | 15 | 10 | | | | |
| | £ | 200 | 0 | 0 | £ | 200 | 0 | 0 |

## APPENDIX E.

### REIMBURSEMENTS TO GOVERNMENT.

| | | | |
|---|---|---|---|
| Sale of flowering and foliage shrubs and trees | £ | 28 | 5 | 0 |
| " " vegetable seedlings | | 18 | 7 | 0 |
| " " vegetables | | 60 | 9 | 2 |
| Live stock sales and service fees | | 70 | 14 | 0 |
| Bulb export certificates | | 3 | 18 | 5 |
| Spraying services | | 4 | 15 | 0 |
| Seedsmen's registration fees | | 2 | 0 | 0 |
| Government Veterinarian's fees for testing animals | | 8 | 2 | 6 |
| Sale of crates from Packing Houses | | 83 | 10 | 0 |
| | £ | 280 | 1 | 1 |

## APPENDIX F.

### FARMERS' MARKET.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Balance brought forward | | | | | £ | 3 | 1 | 6 |
| Received for hire of stalls | | | | | | 75 | 15 | 0 |
| Rental of Market | £ | 50 | 0 | 0 | | | | |
| Lighting | | 3 | 12 | 6 | | | | |
| Supplies and contingencies | | 10 | 10 | 0 | | | | |
| Unexpended balance carried over | | 14 | 14 | 0 | | | | |
| | £ | 78 | 16 | 6 | £ | 78 | 16 | 6 |

HILDA C. LINES,
Clerk, Board of Agriculture.